AMERICAN
DYESTUFF REPORTER

VOLUME XXIV DECEMBER 2, 1935 NUMBER 24

Uneven Dyeings in Finished Goods*

By PROF. ING. LEO KOLLMANN

IT IS a well-known fact that finished goods produced from predyed yarn, which seem, upon inspection, to be evenly dyed, appear streaky (two-toned, or "singed," this phrase is used in a colloquially technical sense, to indicate that the goods appear as though they had been unevenly singed and the pile brought to an uneven depth, when this is not the case at all, but is merely a superficial resemblance to such a defect), or that the unfinished goods, after dyeing in the piece, show that same undesirable effect. When it is a question of profit-dyeing, there is often a tendency to lay the blame for this mishap upon the dyer. In view of the unfavorable position of the finishing industry, which, of course, desires to keep its customers, it is an easier and a probably more successful way out to pass on a complaint to the dyer, as being the next preceding agent in the series of those through whose hands the goods have passed, rather than to the yarn-dealer, the spinner, or the one from whom the raw wool or cotton was purchased. However, in what follows, it will be seen how manifold may be the causes of trouble coming into consideration in the case of the above-mentioned defects alone.

Let us first of all consider the following typical case. A small lot of woolen yarn, after washing, is dyed to a certain shade in the usual manner, in a single operation. The goods, which appear to be quite uniform in quality in the strand, are at once carried through the usual processes, oiling, spooling, etc. But now, in a single length, there will appear lighter and darker tones, as streaks upon the yarn, or as definite sections comprising the whole body of the yarn transversely. If such an unevenly dyed strand be picked apart, it will be found that the transition between the lighter and the darker tones is not a gradual alteration in the course of the fiber, but that, at the point of transition, a lighter fiber is linked up with a darker one. In going further, if we examine the lighter and the darker portions for information regarding the physical consistency of the material, as to yarn number, twist, breaking strength, uniformity, elasticity, etc., we find no essential differences. The matter can obviously be no concern of the dyer. Through unskillful dyeing, various defects may arise, such as spotty dyeings, or more or less uneven dyeings of certain types, but not dyeings which in a given section of the yarn are level as to their own tone, but differentiated from other strands also dyed level, and knotted together at the transition-point.

In such a case as the above, a difference in affinity for the dyestuff is usually to blame. The lot of woolen yarn provided for dyeing contained yarns which, to be sure, appeared to be uniform in aspect, at least, and in physical characteristics, but which originated from different spinnings. Even though two lots of wool are not particularly different in color, class, feel, staple length, etc., yet they may show noteworthy differences in their affinity for dyestuffs. Such differences are easily to be understood, when we recall that the wool-substance, keratin, is not a homogeneous substance in the chemical sense. According to Bowman, analysis of four different lots of wool gave the following differences in value upon analysis:—

Carbon	49.8-52.0%
Hydrogen	6.0- 7.2%
Nitrogen	17.8-21.3%
Oxygen	19.9-21.3%
Sulfur	2.3- 3.8%

Of still greater influence upon variations in the dyeing properties are the alterations which are brought about by exposure of wool to light, alterations which possibly possess some connection with the just-mentioned differences in chemical composition. By exposure of wool to light, a more or less decided yellowing takes place; if a piece of woolen cloth be partly shielded and exposed to light, and then dyed with an acid dyestuff, a decidedly evident difference will be observed in the colortone of the irradiated portion as compared with that of the shielded portion; and this difference cannot be ascribed wholly to the mere yellowing of the wool. It has been stated that wool, after exposure to light, loses some of its affinity for acid dyestuffs, yet the contrary is usually true. All garment dyers know that, in a worn garment to be redyed, the parts which have been most exposed to light dye darker. This result may be avoided as experiments have shown, by scouring the wool at the boil, before dyeing, and by the use of certain dyestuffs especially recommended for the purpose by the color companies. It is to be supposed that

*Translated and somewhat condensed from Monatschrift fuer Textil-Industrie, 49, 18 and 40 (1934).

differences in affinity for the dyestuff, in the case of otherwise similar sorts of wool, are conditioned not only by the race, constitution, life-conditions (food), and disease of the sheep, but also by merely climatic conditions especially the degree of solarization to which the sheep have been subjected during the growth of the particular lot of wool, so to say, yielded at a particular time. Possibly, also, the occasional wetting of the wool, during growth, by rain, and the quality and quantity of the wool-sweat, are of some influence upon the action of the sunlight, or upon the affinity for dyestuffs.

Of less influence, yet not casually to be waved aside, upon the dyestuff-affinity might be considered the possible alterations in the keratin, brought about in the washing of the wool in alkaline bath, etc.

Apart from differences in actual tinctorial affinity, caused by chemical alteration of the wool substance, the influence of the natural color of the wool upon the finally attained color-tone is not to be underestimated. Now and then the dyer can distinguish, in a given lot of wool yarn, strands which are yellower or whiter than the average; especially when the yarn, in wetting-out or washing before dyeing, is hanging upon the same pole. Naturally, the dyer cannot be expected to sort out the more yellow strands previous to dyeing, and to dye them separately.

The washing of the yarn before dyeing cannot be of any influence upon a two-tone defective result, since affinity-differences for dyestuff can exist in well-washed yarns, and also in those which, because of their cleanness, and to avoid felting, are dyed without previous washing (or, at least, perhaps, with an acid-stable wetting-out agent).

It should further be remarked that level-dyed yarns can produce two-toned effects if they are, in the working-up, unevenly oiled, or become soiled. As a rule, however, this difficulty disappears when the affected portion is cleansed from the oil or dirt. However, if, after such manipulation, the affected portion remains two-toned, and, after stripping, and redyeing, again comes out streaky, then, without question, yarns of different affinity for the dyestuff have been worked up together into the same yarn.

If, also, woolen yarns, which have been dyed apparently level in one lot, on further working up display a two-tone effect, the dyer again usually deserves none of the blame. The trouble should be ascribed to the varying affinity of the parts of the yarn to the dyestuff, or, more precisely, to the fact that more than one sort of wool has been worked up into the one lot of yarn. It can be regarded as self-evident that a two-tone effect is to be expected, from purely optical grounds, if yarns of different number or twist are spun together.

A further undesirable phenomenon occurring in woolen goods is the occurrence of so-called "singed" areas; that is, areas of shorter and longer fibers, with lighter or darker tone, or even a different tone entirely occur. This trouble can be traced back to the use of a non-uniform mixture of wool, especially when single yarn has been used. It can occur, just as the previously-discussed two-tone effect, either in the working up of predyed yarn, or in piece-dyeing. Frequently, in this case, an actually non-level dyeing can be the fault of the dyer. If so, it can be obviated, if the affected part is washed, stripped, and re-dyed. In some cases microscopic investigation shows that the darker appearance of single filaments is due to the presence of naturally-colored black wool-hairs, which have been spun in with the white material. In most cases, however, the darker fibers are light ones which have been soiled before or after dyeing, and are therefore of temporarily darker shade. A soiling of the yarn before dyeing can usually be remedied by washing, but occasionally the dirt adheres so closely to the wool, that it can hardly be removed, before washing, by local spot-cleansing with suitable agents. If, therefore, the soiling did not take place originally through carelessness of the dyer himself, he will do well to notify the authorities of the matter, and so avoid being held responsible for the resulting damage. This is further to be recommended, because soiled portions, even after complete removal of the dirt, are not seldom capable of dyeing darker because of alterations in the wool-substance by the contaminant. In general, one cannot expect the commercial dyer to cleanse material which has been turned over to him in a soiled condition, through unusual, tedious, costly manipulations, with a doubtful result facing him at the end in addition; he is supposed to dye it only. If the soiling took place after the dyeing of the yarn, it can usually be removed through proper cleansing of the yarn, or of the affected portion of it. Usually soiling takes place through oily, ferrous grime, in the factory. In the undyed yarn, or in the undyed goods, such areas are easily detected by their strong fluorescence under the quartz lamp, and through the Prussian blue test.

Generally speaking, with the occurrence of "singed" areas, we can distinguish between the following three cases:

1—With undyed material, the darker portions of the filament are already in the yarn, but are, at the very latest, also recognizable in the piece goods from the yarn. In this case, there exists a contamination of the yarn in the spinning, in handling, or in working the yarn up under some circumstances, the yarn contains black wool. Actual dirt can, in the less severe cases, be removed by washing the goods before dyeing.

2—It may happen that the raw yarn, or the goods worked up from it, appears uniform, and that it appears as though singed unevenly. In this case, there exists a locally increased or decreased affinity of the wool for the dyestuff, for which the dyer can be held responsible as little as in the preceding case.

3—We have to take account of such cases as those in which the goods appear "singed" after tensioning of the dyed yarn. As the cause of this, a soiling of the yarn, before or after dyeing, is to be considered. If the portion of the goods in question becomes uniform or nearly so in

(Continued on page 692)

Cotton Filling Materials

By DAVID HIMMELFARB*

THE bedding and upholstered furniture industries use practically all of the commercial fibers for stuffing purposes to impart to the products soft and resilient surfaces for sitting or reclining. The fibers used include the waste by-products from textile processes involving wool, silk, rayon, cotton, hemp, jute, as well as staple cotton, kapok, and grass fibers like Spanish moss, palm fiber, sisal, etc. Wool noils, tanners' wool, silk noils, cotton spinning wastes, linters, motes, jute butts from rope mills, etc., are some of the sources of the fibers used for filling purposes. There are also used fibers obtained from materials associated with fabrics. These include napping machine wastes, shredded or garnetted clippings, and shoddy.

Cotton is the most widely used of all the vegetable fibers. It is used in the form of staple, linters, motes, and wastes, or mixtures of any of these worked into garnetted battings or felts. For the purpose of this paper, the fiber study will be limited to cotton because of its relative importance in the industry.

SOURCES

The sources of cotton fiber materials for filling purposes, other than staple cotton, can be divided into the following groups:

A. Linters.
B. New cotton mill processing wastes including picker, fly, willow, card, comber, and sweepings.
C. New reclaimed wastes from fabrics including napper waste, and shredded or garnetted clippings.
D. Second hand reclaimed waste from fabrics, particularly shoddy.

The fillings are made from the materials as indicated, or are made up in the form of felts which are more resilient and command a higher price.

TECHNOLOGY OF COTTON FILLING MATERIALS

Linters are the short fuzzy fibers adhering to the cotton seed after the ginning process. They are removed from the seed by a delinting machine which is primarily a series of circular saws mounted on a shaft and turning through the seeds at a high velocity. There may be first cut, second cut, and/or mill run linters, depending upon the market demand. A complete study of linters can be obtained from standard works and it is needless to elaborate except to indicate that the difference in resiliency and feel in the various types of linters is due to the kinkiness of the fibers. Southeastern linters are composed of fibers that are fairly straight. The bends that are present are not very sharp. The material is smooth, silky, with little resilience. Valley stock is composed of fibers that are somewhat more bent or kinky than are southeastern, but not quite so kinky as fibers of western character. Valley linters are fairly smooth with considerable resilience, while western linters are harsh and have the most resilienc.

New Cotton Mill Wastes are the waste materials associated with the cotton spinning mill and these include picker, fly, rovings, sweepings, card, comber, and willow wastes. The percentage of waste in making the yarn constitutes 7 to 16 per cent of the fibers used[1]. These wastes are rarely used by themselves but are usually incorporated into a felt with linters or other materials, the relatively long fibers acting as a binder. Their microscopy is essentially that of cotton fibers, completely covered in the literature.

New Reclaimed Wastes are the wastes obtained from new fabrics. Napper waste is a material of short fibers obtained from the cloth of the napping machine in the manufacture of napped fabrics, blankets, rugs, etc. The fibers are usually short and are used as obtained from the process. They are sometimes blended with long fibered stock and made into a felt, the longer fibered material acting as a binder, and usually contain wool or rayon with the cotton fibers. Napper waste fibers form a resilient aggregate. Shredded or garnetted clippings represent materials obtained from the reworking and processing of new tailors' clippings and other clippings from textile fabrication processes which have used new fabrics. Shredded clippings are prepared by breaking up the material in a picker machine which consists of a rapidly rotating cylinder with coarse teeth that tear the clippings into fine shreds and threads. If this material is sent through a garnetting cylinder and the threads broken up, garnetted clippings are obtained. The clipping wastes are characterized by the presence of soft threads—small portions of yarn which have escaped being broken into their ultimate fibers. Because the fibers have at one time been processed for spinning into yarn, these wastes are usually cleaner than the original new stock and much cleaner than linters. If the materials as described have been prepared from second-hand rags or clippings which are in whole or in part old, worn, or second-hand, they are designated as shoddy[2]. This term shoddy is not to be confused with

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[1]Matthews, J. M.: The Textile Fibers, 4th Ed., p. 407, John Wiley & Sons.

[2]Laws and rules applicable to . . . bedding, upholstered furniture, and materials used therein. New York State, Department of Labor.

that product of the woolen fabric industry which uses the term to indicate a fabric made of clippings or reworked fibers.

Cotton Felt is the product made from linters or mixtures of linters and wastes. It is the most widely used form of cotton filling and is a resilient pad several inches thick made up of many layers of carded cotton fibers. The layers or webs may be fine or coarse depending upon the adjustment and speed of the operation. The process used in felting consists of passing the waste through a picker machine to break up the material and then into a garnetting machine which consists of a rotating cylinder that separates and combs out the fibers, causing them to leave in a thin sheet or web. The cylinder has many fine saw teeth of tempered steel and rotates at a high speed. The machine is equipped with a blower which removes the waste and there is a piping arrangement to return the blown waste to the cylinder for reworking. The web of cotton fibers is carried along a conveyor to a "lapper" which continuously arranges the web in the form of layers until a felt of the desired thickness is obtained.

MICROSCOPIC STUDIES

In the examination of cotton fillings, the microscope assists in the identification of the type of material the sample contains. Photomicrographs of typical fields encountered in the examination of new reclaimed wastes are shown opposite. A shows the fibers of a napper waste They are of uniform diameter but broken off and short. The fibers are not distorted nor evidently damaged, not having been exposed to a garnetting or picking process. There are present foreign dirt particles, etc. B and C are mounts of fibers from samples of garnetted clippings. Of particular interest are the damages in the cotton fibers due to the reworking of the threads back into fiber form. The dark cotton fibers toward the centers clearly show the damages. Not all of the fibers will show such breaks, but as different fields are encountered damaged fibers will show up. In this connection, the congo red stain test for damaged fibers[3] cannot be used to great advantage because a reworking process for the preparation of filling material damages most of the fibers to a degree, and the test shows up a majority of the fibers with stained lumens.

The appearance of the fibers in shoddy, a filling reclaimed from previously used fabrics, is shown in photomicrograph D. Although this material was designated as cotton shoddy, there are present wool fibers which are conspicuously damaged. The raveled ends and frayed centers of the wool fibers can be seen clearly. There are small cotton fibers in the center of the field, the surface and ends of which are damaged. Fibers of shoddy as a rule are more broken than those in any other reclaimed or reworked waste because the age and use weakens them, creating a tendency to become brittle and give way when undergoing mechanical treatment. Shoddy is usually dirty.

Photomicrographs E, F, and G, are typical fields encountered in the examination of various types of new cotton felts. E shows the fibers of a cotton linter felt. The fibers are uniform, whole, clean, with no apparent damage. This is in contrast with F which is from a sample of low grade felt containing several types of wastes. The fibers are not uniform, of variable origin, somewhat distorted, but not evidently damaged. Physical inspection of the sample showed the presence of reworked materials. The sample was not as resilient as that in E, as would be expected from the fibers present. G is a photomicrograph of a colored cotton felt containing napper waste as a component. The small cut fiber is typical of the napper fibers encountered.

Photomicrographs H and I are taken from samples of previously used, second-hand cotton felts. A careful inspection will show that some of the cotton fibers are excessively broken up and even appear to have a shredded appearance. I was taken from the center of a mattress used for over three years. Chemical tests on the sample did not show it up as second-hand because of the lack of penetration of body wastes through that thickness. The sample was reported suspicious because of the damaged fibers found throughout the sample and the physical appearance of the material.

CHEMICAL STUDIES

Practically all the states in the country require the proper designation of the fillings in bedding and upholstered furniture, and a statement whether the fillings are new or previously used materials. Physical and microscopic inspections are used to determine the type and origin of the fibers present in the filling material. Chemical tests are used to determine whether a sample of cotton filling is previously used or new.

Chemically, cotton is essentially cellulose associated with organic materials, waxes, and mineral salts. There is always some oxycellulose present, formed by the oxidation from air exposure of the cotton, the amount depending upon the time and condition of exposure. In an interesting series of tests on the aging of cotton, Winne and Donovan[4] reported the different fluorescences observed when samples of old and new cotton were exposed to a

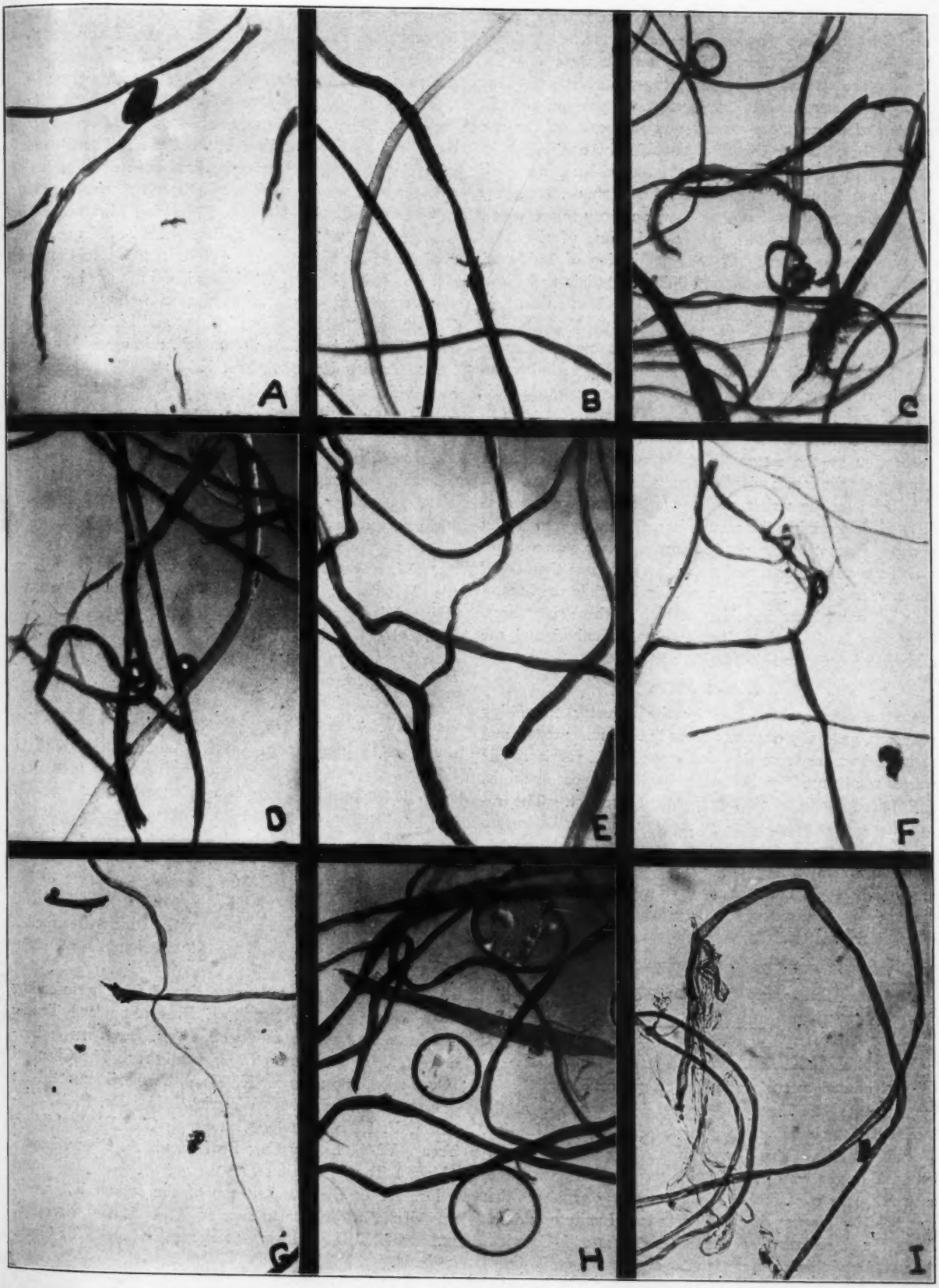
[3]Bright—Jour. Text. Inst.: XVII—8, T396 (1926).

[4]Winne and Donovan, Amer. Dyestuff Rep.: V. 21, p. 601, Oct. 10, 1932.

KEY TO ILLUSTRATIONS

On Page Facing

A—Napper Waste X100
B—Garnetted Clippings X100
C—Garnetted Clippings X100
D—Shoddy X100
E—New Cotton Felt X100
F—New Cotton Felt X100
G—New Cotton Felt X75
H—Second Hand Cotton Felt X100
I—Second Hand Cotton Felt X75


A
B
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ray of ultra-violet light. The fluorescence of new cotton varied from a deep purple of the short linter to a brilliant blue of the staple fiber. If the sample were old, the fluorescence was changed to an ivory-whitish color. This change was attributed to the oxycellulose present, and the amount of oxycellulose present was a function of the age of the fiber. There are limitations in the application of this test to distinguish new from second-hand material. Some new foreign cotton wastes, for example, stored in humid climates were found to show an ivory fluorescence. As a supplementary test, Burke and Kane of the New York State Department of Labor, Division of Industrial Hygiene, reported new cotton filling materials to have a water soluble sulfate content appreciably lower than second-hand, and the dividing line of 0.25% Na_2SO_4 was established. This criterion held in most cases, but was found to have little significance in itself where the wastes had been treated with earth salts or exposed to sulfur dioxide gas fumigation.

A new test for second-hand cotton fillings[5] based on the adsorption by the cotton filling of substances present in urine, perspiration, and other body emanations has been developed by the writer and co-workers. This test consists of determining the ammonia and urea content of an aqueous extract of the cotton sample. New cotton materials have an ammonia and urea content of less than 0.030 per cent and 0.010 per cent, respectively, while used materials will run higher for either or both of these substances. The urea is determined by the urease method and the ammonia by a micro distillation method.

SUMMARY

Cotton fibers when used by the industry for filling purposes, generally originate from linters, mill wastes, and reclaimed wastes from new and second-hand fabrics. The wastes can be used by themselves for the purpose or mixed and felted to form a more resilient product. The reworking of the fibers tends to damage and break them up so that it is possible to observe their presence by microscope examination. Physical inspection and microscopic study will reveal the sources of the wastes present in a material. Chemical tests are necessary to determine whether the material has been previously used or is new, but such tests are subject to limitations indicated.

[5]Moskowitz, Landes, and Himmelfarb. Amer. Dyestuff Rep., 24, 463 (1935).

Annual Meeting, U.S.I.T.R.

THE annual meeting and dinner of the United States Institute for Textile Research, Inc. was held at the Waldorf-Astoria Hotel in New York City on Thurday, November 14th. There were about three hundred members and guests who attended this meeting of the institute as well as the conference on rayon creping problems that was held by request of the Throwsters Institute and the American Association of Textile Chemists and Colorists. As a result of this latter conference a new project, designed to round out the study of these problems, will probably be organized under the direction of the Throwsters Institute and the A. A. T. C. C.

Dr. Robert Andrews Millikan, eminent physicist of the California Institute of Technology, and Dr. J. R. Katz, director of the institute's research on warp sizing, presented the leading addresses at the dinner. The following papers, describing the actual application in textile mills of new research results, were received with unusual interest: "The Cotton Classer Uses the Polarizing Microscope" by Chester L. Pattee, technician, Pequot Mills, Salem, Mass.; "Scientific Wool Top Standardization to Meet Commercial Conditions" by E. O. Kruegel, Fellow of the Textile Foundation working at the Massachusetts Institute of Technology; "Silk Filaments' Shape and Size Cause Two-Tone Dyeing" by F. A. Mennerich, microscopist, United States Testing Co., Hoboken, N. J.; and "The Physicist in the Textile Industry" by Dr. I. J. Saxl, director, research and development, Waypoyset Manufacturing Co., Pawtucket, R. I.

Among the guests at the dinner in addition to Dr. Millikan, the guest speaker, were the following: Franklin W. Hobbs, chairman, Frank D. Cheney, director and E. T. Pickard, secretary, The Textile Foundation; Dr. Karl T. Compton, president, Massachusetts Institute of Technology; W. Ray Bell, president, Association of Cotton Textile Merchants; Charles W. Dall, president, National Rayon Weavers Association; Peter Van Horn, president, National Federation of Textiles, Inc.; H. E. Bishop, executive secretary, Throwsters Research Institute; Dr. Henry A. Barton, director, American Institute of Physics; Howard A. Poillon, president, Research Corporation; Dr. George W. Raiziss, Dermatological Research Laboratories.

Among the notable actions at the annual meeting of U. S. Institute was the adoption of amendments to the by-laws that provided for greater recognition of scientists and technicians on the board of directors and as officers; the report of Secretary Clark noting a large increase in membership, particularly of the contributing class, which qualifies to receive confidential progress reports of researches, and the report of F. S. Blanchard, chairman of the committee on economic research, which described a proposed study of vertical integration of textile merchandising and manufacturing.

The following directors were elected for a term ending in 1938: James T. Broadbent, Pres., Standard Textile Products Co.; Alban Eavenson, Pres., Eavenson & Levering Co.; Hon. Francis P. Garvan, Pres., The Chemical Foundation, Inc.; Ernest N. Hood, Treas., Pequot Mills; Weston Howland, Pres., Warwick Mills; Dr. E. H. Killheffer, E. I. du Pont de Nemours & Co.; W. S. Libbey, Treas., W. S. Libbey Co.; Prof. Louis A. Olney, Lowell (Mass.) Textile Institute.

Dr. W. E. Emley, chairman of the Research Council, was elected a director to succeed A. L. Lustig, deceased, and Prof. E. R. Schwarz to succeed Thomas T. Clark, resigned.

PROCEEDINGS OF THE
American Association of Textile Chemists and Colorists

DECEMBER 2, 1935

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Headquarters: Read House

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General Arrangements Committee

CARL Z. DRAVES
Chairman
Technical Program Committee

Proceedings of the American Association of Textile Chemists and Colorists

Consumer Technical Information

*Its Preparation and Distribution**

By D. E. DOUTY†

EDITOR'S NOTE—*As indicated in the report of the meeting of the New York Section on October 25th* (AMERICAN DYESTUFF REPORTER, *November* 18, 1935 [332] 658), *William D. Appel discussed consumer specifications and the A. A. T. C. C. before the presentation of the following paper. Dr. Appel's remarks will be published in a later issue of the* REPORTER.

WHEN Dr. Freedman asked me to prepare a paper for this meeting upon some phases of the present consumer movement, I hesitated because as a laboratory executive I am more closely associated with the economic side of the movement than with the technical phases. I have always looked upon the American Association of Textile Chemists and Colorists as one of our most active, virile, and progressive, although younger technical societies. You are doing things, you are essentially technicians, your personal interests lie along lines of physical-chemical technique. Therefore, before replying to Dr. Freedman, I paused to consider whether I could possibly formulate the commercial and economic phases of ultimate-consumer technical information in a manner interesting to you.

Dr. Freedman insisted that I should try.

Ultimate consumer—In what follows, the term "consumer" means what Boake Carter over the radio calls the "Johnnie Q. Public", the individual who actually applies the merchandise purchased to his personal needs.

Consumer technical information refers to such factual data as can be or should be conveyed to him regarding those things which he acquires and uses.

Within my own scientific experience and limited memory, the beginning, at least in this country, of the movement to furnish purchasers with goods accompanied with factual, technical information started with Dr. Harvey Wiley and his corps of food and drug technologists in the Bureau of Chemistry of the Federal Department of Agriculture. As a college student, I was very much interested in the battle royal waged between Dr. Wiley on the one hand and the canners of preserved foods on the other, regarding the physiologically injurious effects of benzoate of soda and the maximum which might be included in tomato catsup without injurious effects upon the consumer.

The storm raged around Dr. Wiley's shaggy head, held by a powerful body, which towered about 6 ft. 6 inches above the ground, until it blew off nearly all the hair.

Wiley won and the first Pure Food and Drug law was passed by Congress.

How many consumers today examine the labels of So-and-so's Tomato Catsup to find in minute and indistinct type the percentage, if any, of benzoate of sode used in it as a preservative? How many ultimate consumers examine the labels placed on merchandise under the pure food and drug act and, of those who do, how many do you suppose are able to interpret, in terms of safety of use, what they read? I do not imagine it is a very large number. The two questions are suggested not in a spirit of reflecting upon the value of the labelling under the Pure Food and Drug Act, but on account of their bearing on my topic of "Consumer Technical Information, Its Preparation and Distribution".

In my opinion, the chief value of such compulsory labelling lies not in the technical information given to and utilized by the ultimate consumer, but in the restraining influences it exercises over the producer and the direct obligation placed upon him in his relation to health and sanitation regulatory agencies of the State and Federal Government.

From about 1905 to 1912, there was another consumer information flurry in the form of a demand that fabrics and garments should be labelled. At every session of Congress there would be introduced in the House or Senate, sometimes in both, usually by a Congressman from Nebraska, Kansas, Iowa, Wyoming, Idaho, or other non-textile producing States, a "truth in fabric bill", modeled somewhat along the lines of the Pure Food and Drug Act. I remember quite distinctly an ordinary dress labelled to illustrate the requirements of one of these bills. As I remember, the dress was decorated with 43 labels and its display before the Congressional Committee was sufficient to bury the bill indefinitely in the Committee. I believe every Congress since that time has had before it some kind of a "Truth in Fabrics Bill" for consideration by the proper Committees.

The movement for consumer information has continued to grow and expand. Organizations for the protection

*Presented at meeting, New York Section, Oct. 25, 1935.

†President, United States Testing Co., 1415 Park Ave. Hoboken, N. J.

of the interests of the ultimate consumer have come into being and flourished. Unfortunately, in these organizations there has been too much of the spirit of bless the consumer, he can do no wrong; damn the producer, he is full of wrong. There have also appeared organizations who prey upon the movement. Shrewd executives with a keen sense of publicity and sales value have grasped the consumer-information idea for promotional purposes and some of them have been markedly successful. It is very difficult in these times of great productive originality to bring forth any beneficial, humanitarian activity which cannot be and is not degraded by some type of racket.

The consumer-information movement received a tremendous impetus during the flourishing months of the N.R.A. A few years before we had passed through a period of suddenly reduced buying power and marked reluctance towards spending any more than was necessary to meet immediate needs. This brought on a period of price buying. Quality considerations were almost completely discarded by "Johnnie Q. Public".

The result was a rush of cheap, ofttimes deceptive and frequently unserviceable merchandise. As the N.R.A. came into being, a definite reaction towards better merchandise at a fair price had set in. The Consumers' Advisory Board of the N.R.A. was set up to safeguard the interests of the ultimate consumer during the formulation of the Codes. Some of the early Codes slipped through without the protective assistance of the Consumers' Advisory Board. During the period of greatest Code development activity, there were nine organized consumer protective agencies, including the Federal Trade Commission, with representation in Washington. The Consumers' Advisory Board under the late Mrs. Rumsay, and a similar organization in the A.A.A. shared honors in assuming the leadership of the consumer-information movement.

Within the Consumers' Advisory Board, Dr. Brady, of the University of California, initiated an excellent piece of work on consumer standards and had he been able to continue, he would undoubtedly have brought out, in cooperation with the scientific Bureaus of the Government and with the assistance of the American Standards Association, a very valuable compilation of existing and proposed standards for consumer goods. My impression is that the results never got beyond the mimeographed stage.

The Consumer Advisory Board today resembles a withered, winter Irish potato in July. This is unfortunate for the consumer-information movement because the Advisory Board was one consumer organization which set out to establish consumer-goods standards and to indicate to the producing interests what the consumer needs, what he has a right to expect and what should give satisfactory service. It proposed this plan in place of continuously heckling the producers to set the standards and condemning them for not labelling their products with a lot of technical information which few consumers would be able to evaluate or understand.

The complex and apparently impractical Tugwell Bill, now known I believe as the Copeland Bill, to replace the present Pure Food and Drug Law, was a product of this period and was too elaborate and fanciful for even a New Deal Congress to pass at the last session.

The three fundamental requirements of civilized men are food, raiment and shelter.

Raiment consists in very large part of textiles and textiles in which you are essentially interested furnish an excellent field in which to explore the various proposals for the preparation and distribution of consumer technical information.

Dr. Appel has given you a very excellent discussion of the recent attempts to develop serviceability tests for dress fabrics.

For uniformity of procedure, test methods have been prepared and methods of reporting have been formulated, but the one great need of the ultimate consumer has not been supplied, i.e., methods of rating or grading which will indicate to the consumer the possible serviceability of the fabric in use or its grade level in terms of similar merchandise on the market. Tests made under these methods can be reported by the terms and figures indicated, but how can these test data be distributed to the ultimate consumer, by the use of labels, so that he can evaluate them in terms of his wishes or needs.

One school of consumer advocates propose labelling with each measurable characteristic affecting serviceability set forth with its numerical value or the rating qualification clearly printed on the label. They would require that the manufacturer of sheets, for example, should indicate the type of fiber, number of yarn, count of warps and picks, tensile strength warp and filling, amount of finishing material, etc., etc. They feel that the dress fabric manufacturers should label their product with fiber composition, construction data, tensile strength, amount of weighting or loading, if any, nature of dye, degree of fastness of color to every service condition, etc., etc. This is, of course, an extreme position.

Another group of labelling advocates suggest the establishment of grades for different types and sub-types of merchandise. The technical information in this case would not be set forth on the labels, but the quality control would lie with a set of specifications based upon serviceability characteristics. These grade specifications would be available to those who desired them or for checking up the accuracy of labelling. The intent is that the purchaser would be sufficiently informed but would not be confused with a lot of technical information which he did not understand. I have been informed that this method is the basis of the consumer-information regulations regarding canned, packaged and preserved goods in Canada.

A third proposal is what might be called the certification plan by which the merchandise is carefully and thoroughly studied, specifications are drawn to establish a fixed basis of reference for maintenance of quality and to each article is attached a label stating that the merchandise is regularly sampled, tested for a listed number of characteristics and certified by a neutral, third party laboratory. Back of such a method based upon sampling must stand the guarantee, either stated or implied, of the producer that if any article in the line be found imperfect or not in accordance with the specifications, the producer will make good. No tabulation of technical data is given to confuse the consumer, but back of the merchandise stand the requirements and technical information which protect his interests and should assure him of satisfactory service. The purchaser places his confidence in the reliability, thoroughness and honesty of the certifying laboratory. The method has, like the ones above, the dangers of being carelessly applied or developed into a racket.

A fourth method is the simple one of the manufacturer or distributor placing on the merchandise a label listing the characteristics which he guarantees.

The entire problem of preparation and distribution of consumer-technical information on consumer goods is a very large and complex contract. It can make effective and sustained progress only through organized, coordinated group activities.

The ultimate consumer is an individual. Such voluntary consumer organizations as are being gradually brought together through the enthusiasm, personal devotion and humanitarian impulses of a relatively small number of workers do not have the facilities, the trained personnel, adequate finances, nor the necessary technical outlook to develop the technical part of their great problem.

It requires the coordinated efforts of such technically trained groups as the American Society for Testing Materials, the American Standards Association, your own Association, and similar organizations.

The problem of preparation of consumer information breaks down into two large divisions, viz:

First—Test methods for determining and measuring the characteristics of consumer goods.

Second—The selection, from those characteristics, of the ones which control serviceability and satisfaction in use and the establishment of such specification, limits and ratings as will produce and select serviceable and satisfactory consumer goods.

A considerable amount of data are already available and in the course of preparation on the first division, i.e., Test Methods. There is a woeful lack of information on the second division, i.e., Serviceability Requirements. This must, patiently, be based upon studies in actual service.

I know of no accumulated data of sufficient extent that will show how strong a dress fabric must be to give satisfaction in a reasonably close fitting garment; the minimum strength that a silk or rayon fabric should possess to make as satisfactory and serviceable a lady's undergarment. Some of us have been bold enough to guess 20 lbs. per inch.

We have no accurate accumulated data based upon actual service to indicate the minimum tendency to slip which will give satisfactory service in seams in dresses, underwear garments, coats, suits, or workmen's garments.

Your Association has made the most advanced step yet taken to determine and rate fastness in colors in fabrics. The Munsell System and the Hardy Color Analyser are developments pointing to possibilities, but they belong to the first division, Methods of Test. If and when the method of measurement of color and color fastness is perfected, there will still remain the problem of *HOW FAST* or what degree and type of fading can be allowed and yet give satisfactory service.

The whole serviceability division is one which should properly be assigned to and undertaken by the Home Economics and Extension Departments of the educational institutions distributed over the country, and various consumer service bureaus. They are in touch with the consumer and they have the means at their command to make serviceability studies with and upon the consumer.

As progress is made in the preparation of consumer technical information, it must be disseminated to the consumer, he must be taught to understand it, apply it to his purchases and demand it from the seller. This is the task of the consumer promotional associations, publications, and extension workers.

With almost complete lack of means of expressing consumer needs accurately and reasonably, consumer representatives are pressing retailers to furnish labeled merchandise.

The retailer is not fundamentally interested in obtaining for his customers, technical information upon his wares although the better stores have no objection if it is furnished to them without cost. He is essentially a middle man. He does not visualize his obligations to the public as an educator and uplifter of buyers. His great central idea and driving force is to make money by buying from one man and selling to another at a higher price. He'll tell you so very directly and very bluntly. We know. We're trying to sell him testing.

The pressure for consumer-technical information contained on labels must come from an informed public; it must be based upon consumer standards and should be transmitted through the retailer, the distributor, the intermediate processor to the original producer of the material. With efforts to teach the ultimate consumer to understand, interpret and use technical, label information should also go forceful exposition of the fundamental fact that the higher the quality and better the serviceability of the pur-

chase, the larger the price that the purchaser must be willing to pay.

The converse that the higher the price, the better the quality and serviceability is in general true but does not always follow.

When the consumer organizations, promoting and protecting the interests of the ultimate consumer, can educate their proteges to a state of appreciation of labeled merchandise to the extent that they will be willing to pay the premium which the labeling insurance should give them, the perfectly justifiable and worthy battle to secure labelling will be won. Just as soon as "Johnnie Q. Public" will pay a slightly higher price for a labeled, a certified, a guaranteed article than he will pay for another article which looks just as good to him and, in his confidence in his own judgment, is just as good, the movement for labeling with consumer technical information cannot be stopped. Competition for merchandising advantage and merchandising aids is so keen and essential to merchandising success that they are sought and grasped with avidity. As you probably know, the United States Testing Company, Inc. has during recent years been certifying an increasing number of lines of quality merchandise. The vital question with the client is always,—Has the certification plan a merchandising value? If we can convince the client that it has, we win and hold the certification as long as sales results show its merchandising value and no longer. Of the underselling, we have two excellent examples with our certified quality merchandise. Two clients for whom we develop specifications, established their quality, continuously checked their production and permitted the attachment of a label with the name of the United States Testing Company as the neutral technical authority, met severe price competition of two other producers who imitated their product in a lower quality at lower cost and price and the sales of our clients began to decline. The producer felt that the only possible way to meet this competition was to lower the cost through lowering the quality. We had established the reputation of the grades as quality merchandise; we would not mislead the public; we had no alternative except to discontinue the certification, in complete accord with our clients and at considerable loss in revenue.

When the ultimate consumer is willing to pay the premium for quality insurance, just as he does his life, fire or automobile insurance, he will obtain the protection willingly and readily. He must be educated to the value of quality insurance.

In closing, I wish to return, only for a moment, to the part in this consumer technical information movement which the American Association of Textile Chemists and Colorists should take. You have an excellent opportunity to contribute further to the standardization work. You have done some excellent work on methods of testing, there is much more to be done. In your future program of committee work, extend it beyond the methods of testing into the field of consumer standards, consumer needs, and serviceability ratings.

In our opinion, the consumer-information labelling movement is here to stay and you can do much through your technical contributions to make it valuable and effective.

DISCUSSION

Chairman Freedman: I know there are many questions that you want to ask, and we are ready for them now. However I will first call upon Dr. Meyer to tell us something about these standard specimens that I understand he has brought with him, disclosing the fastness for crocking.

Hans Meyer: We have worked on this proposition for some time, for over a year, and we have now developed standards for fastness to crocking on wool. We selected as the lowest standard Victoria Blue, a basic color, which we all know is practically no longer used in wool, because it is not fast to crocking. Then, for the second standard, we selected Patent Blue A, and for the last standard, Alizarin Rubinole R. There are a good many other colors, which could be used for this standard and we are not quite sure whether this selection is final. I will bring the dyes and everything to the next meeting in Boston, and we can finally decide what we really should accept for the best standard. There is a choice between a lot of colors.

The next question is, "Shall we put up standards for all different materials?" I think that it is really necessary, because wool alone wouldn't be sufficient. I imagine if we put up a standard for wool, for cotton and for silk, that would practically cover the whole field.

I also worked out a series of tests for cotton. Of course, for the lowest grade, we can take any basic color, like Basic Green, or Victoria Blue, and then for the second grade, there is Primuline, which is a very good example, because it shows a certain crocking. Then, for the first grade, the question is whether we should stick to a developed color, or go into vat colors, which are generally fast to crocking. I also have some specimens which I will bring to the next meeting.

In silk, it is not so easy. It is very easy to find the lowest grade and the highest grade, but to find one color which is just exactly between is another matter, and so far, I haven't been able to find anything which would meet the requirements, but probably we can find it for the next Year Book; also, we will have something to show.

For rayon, I think we can accept the cotton standard. Next is acetate silk. I went through the whole line of colors, and it is very difficult to find something which is a grading—I mean between the lowest and the highest—

but I imagine we can also go back to the cotton standard for this purpose. I think if we have standards for the three kinds of materials, for wool, cotton and silk, that will cover the whole point.

The next question is this: According to present specifications, we are rubbing by hand. We all know that it is not specific enough, and that there are a good many variations—somebody rubs twenty times and thirty times. It all depends on the pressure he applies.

The next question would be to find an apparatus, a simple apparatus, a cheap one, which we could put in every dye house and every factory—not an apparatus which would cost $75 or $100, but just a simple thing. I have worked with Dr. Appel on a little machine, but I don't know how far he has gotten with the whole device.

Dr. Appel: I haven't built it yet. I know how to.

Dr. Meyer: It would of course be much easier for a mill man, who has an engineer in his workshop, to put up an apparatus. There is a little machine in use abroad which costs about twenty-five marks, so it would be within the reach of everybody. It is a very simple machine, developed by Professor Krais. I brought the sketches along and I can also put the whole thing before the Research Committee at the next meeting. We will probably come to some understanding, and the Association will probably bring out such a machine.

Dr. Douty: We will be very glad to build one for you in our shop, if you will give us the drawings.

Chairman Freedman: Thank you, Dr. Meyer.

Mr. Krassner: That question of crocking is quite an important question in the Navy Department. Recently, we have encountered a number of materials with which we have had difficulty, and I was rather disappointed to hear from Dr. Appel's paper that there hasn't been a new method developed for this. The method, as it is at present in the official book, is only a tentative one, and, as pointed out by Dr. Meyer it is rather unsatisfactory. The human element enters into it to too great an extent. That is, you get various results depending upon the pressure that you apply.

I was given to understand, recently, that there has been some work done at the Bureau of Standards and a method developed that left out the human element to some extent, and that it was somewhat simpler. I don't know how far that work has gone, but if there has been any such work, I would like to know about it, and also about this apparatus that Dr. Meyer speaks of, which would be a great improvement over that particular method.

Then, commenting on Dr. Douty's talk,—which I enjoyed very much—I think there is one point that probably was not brought out as emphatically as it might have been, and that is, the point that we have really different types of consumers, and I think therein lies the fault of the standardization. The standardization has been too much along the lines of developing specifications and standards for the organized consumer, like the large corporations, the government bodies, and so forth, and to translate these specifications in term of the ultimate consumer, the gap has been far too wide, and the real job is to accomplish that. So that if we differentiate between the two types of consumers and interpret one in terms of the other, we will have accomplished a great deal.

Chairman Freedman: Thank you, Mr. Krassner.

Dr. Appel: I might reply to Mr. Krassner about the work on crocking at the Bureau.

We have a ilttle reciprocating mechanism with a deadweight for testing rubbing of paper, which could be used for crocking tests—a very simple little outfit. It is motor driven, but it doesn't need to be, and I told Dr. Meyer some time ago that as soon as we got around to it, we would build a little outfit like that and try it out.

I would also like to make one other point, and that is, that it is true that if you rely on everybody producing the same pressure with his finger, they won't do it, but if you have the standard sample, then you can test an unknown against the standard, and you can easily find out by trying several pressures whether it is as good or worse than that standard sample. That is the point I wanted to make.

Mr. Volkman: In that apparatus, is the cloth used, specified other than that it be bleached white cotton cloth?

Dr. Appel: I am sorry you asked me that question, because the answer is, "No." That is one place where the method is weak at the present moment.

Dr. Meyer: I imagine we can easily specify a certain one. Of course, in the specification, we would have to state whether it was wet or dry, probably, because there is quite a difference. I mean we can easily put down a specimen of a cotton cloth used for this rubbing. That will be put in the test anyhow.

Dr. Appel: I would like to say this: that in the development of these methods, we have been guided a good deal by the demand for these things. Dr. Meyer's rubbing test has been on the books for a number of years, and I don't know that you have heard much criticism of it. I haven't. We are using similar tests in the government. If the members of the Association don't use these tests, or don't kick about them and complain about them if they are not satisfactory, we don't have any incentive to do more work on them in the Research Committee.

The other point is that in the development of this commercial standard, there is so much to it, and so many important features that have to be discussed, that there is a very decided advantage in avoiding some of these perhaps less important things. The thing is written just as simply and with as little detail as possible, but, as you point out, things like the type of cloth you rub against and others

(Continued on page 685)

FIFTEENTH

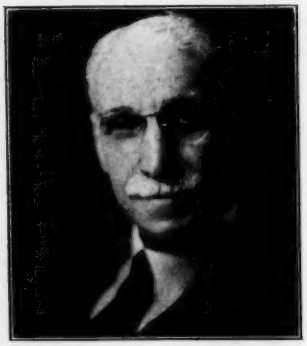
ANNUAL MEETING AND CONVENTION

AMERICAN ASSOCIATION OF TEXTILE CHEMISTS AND COLORISTS

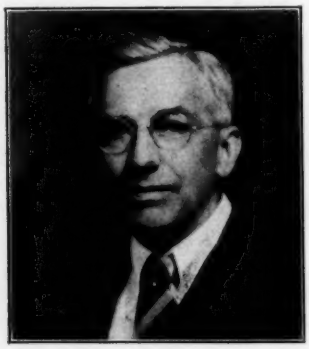
December 6 and 7, 1935

READ HOUSE
CHATTANOOGA, TENN.

UNDER AUSPICES OF SOUTH-CENTRAL SECTION



LOUIS A. OLNEY
President Emeritus and Chairman, Research Committee



H. C. CHAPIN
Secretary

WILLIAM H. CADY
Vice-President

CARL Z. DRAVES
Chairman, Technical Program Committee

ANNUAL

CHATTANO

PRO

FRIDAY, DECEMBER 6

10:00 A.M.—Registration Opens in Lobby of Read House.
1:30 P.M.—One hundred fourth Council Meeting.
2:00 P.M.—Sight-seeing trips—Cars furnished.
2:30 P.M.—Ninety-seventh Meeting of Research Committee.
3:00 P.M.—Bridge for Visiting Ladies.
6:30 P.M.—Buffet Supper in Ball Room of Read House.
7:45 P.M.—OFFICIAL OPENING OF CONVENTION.
7:50 P.M.—A Resume of the Properties and Uses of Ultraviolet Radiation—with demonstration
JOSEPH L. MCEWEN, *National Aniline and Chemical Co.*
8:20 P.M.—The Application of Optical Instruments in the Textile Industry for Routine and Research
J. H. SCHERING. *Bausch & Lomb Optical Co.*
9:00 P.M.—Eyes of Science—a motion picture
J. H. SCHERING, *Bausch & Lomb Optical Co.*
9:30 P.M.—Entertainment.
10:30 P.M.—Dancing.

SATURDAY, DECEMBER 7

9:30 A.M.—Accelerated Ageing Test for Weighted Silk
WILLIAM D. APPEL and DANIEL JESSUP. *National Bureau of Standards.*
9:55 A.M.—The Chemistry of Wool and its Relationship to Practical Processing
MILTON HARRIS, *A.A.T.C. & C. Research Associate at the National Bureau of Standards.*
10:30 A.M.—Cotton Printing: An Outline
SAMUEL I. PARKER, *Ciba Co.*
11:00 A.M.—Some Recent Developments in the Application of Sulfur Dyestuffs
JOHN L. CRIST, *Calco Chemical Co.*
11:30 A.M.—A Review of Recent Analytical Methods with Special Applications to Textile Analysis
IRVING W. GROTE, *University of Chattanooga.*

DECEMBER

AND CO

MEETING

OOGA, TENN.

ROGRAM

12:00 M. —BUSINESS MEETING.
Annual Reports of Officers and of Committee Chairmen; Election of Officers and Other Business.

RECESS FOR LUNCHEON

2:00 P.M.—Comparative Tests for Value of Sulfur Trioxide in Different Amounts in Sulfonated Oil
ALBERT H. GRIMSHAW, *North Carolina State College.*

2:25 P.M.—Conditioning Water for the Textile Industry
H. H. MORRISON, *Permutit Co.*

2:55 P.M.—The Influence of the Finishing Operations on the Light Fastness of Vat Dyeings
CHAS. SEIBERT, *E. I. du Pont de Nemours & Co.*

3:25 P.M.—Peroxide Bleach Baths and Some Factors Influencing their Stability
D. J. CAMPBELL, *R. & H. Chemicals Dept., E. I. du Pont de Nemours & Co.*

3:55 P.M.—Synthetic Resins: Their Development and Application to Textiles
D. H. POWERS, *Röhm & Haas Co.*

4:30 P.M.—New Developments in the Application of Naphthols and Vats for Dyeing and Printing
S. H. WILLIAMS, *General Dyestuff Corporation.*

5:00 P.M.—Activities of the Raw Silk Committee of the National Association of Hosiery Manufacturers
E. M. SCHENKE, *National Association of Hosiery Manufacturers.*

3:00 P.M.—Bridge Tournament for Ladies.

7:00 P.M.—BANQUET. (Dress optional)
Toastmaster: A. R. THOMPSON, JR.

7:55 P.M.—ENTERTAINMENT.

8:15 P.M.—Speakers
HON. E. D. BASS, *Mayor of Chattanooga*
DR. L. A. OLNEY
WILLIAM H. CADY
DR. ROBERT E. ROSE

10:00 P.M.—Textile Ball.
11:30 P.M.—Style Show.
11:45 P.M.—Floor Show.
12:00 P.M.—Dancing Continued.

ER 6TH AND 7TH

O VENTION

ROBERT E. ROSE
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WILLIAM R. MOORHOUSE
Treasurer

ARTHUR R. THOMPSON JR.
Vice-President

WILLIAM J. KELLY JR.
Chairman, General Arrangements Committee

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ROBERT E. ROSE

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Secretary
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President Emeritus and Chairman of Research Committee
LOUIS A. OLNEY

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LOUIS A. OLNEY 1921-1927
ELVIN H. KILLHEFFER 1927-1930
P. J. WOOD 1930-1932

Councillors at Large
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DONALD H. POWERS
CARL Z. DRAVES
WILLIAM D. APPEL
HUGH CHRISTISON
HENRY F. HERRMANN

Technical Program Annual Meeting
CARL Z. DRAVES

Officers of South Central Section

Chairman
HAROLD SCHROEDER

Vice-Chairman
NESTOR GROTELUESCHEN

Secretary
HARVIE BRUCE KIMBRELL

Treasurer
HOMER WHELCHEL

Convention Committee

Publicity and General Arrangements
WILLIAM J. KELLY, JR.

Transportation
JOHN L. DABBS, JR.

Reception
WALTER E. HADLEY

Registration
HERBERT A. RODGERS

Scenic Outings
HARRY H. MORRISON

Textile Ball
A. HENRY GAEDE

Ladies
MRS. HAROLD SCHROEDER

Consumer Information—

(Continued from page 680)

will be elaborated as it is revised from time to time to meet the needs as they develop.

There are a lot of things like that that certainly can be improved greatly, and some of the discussions we have already had have brought out those points, but the work has not yet been done. I have hopes that you people will use the methods and criticize them, and send your criticisms to the Research Committee and the Subcommittees, so that steps can be taken to strengthen the methods where they are weak.

Dr. Harold: I would like to say that in this part of the Committee's work on crocking, the character of material used in making this rubbing test against the dyed article should simulate the expected contact of the article. For example, if you were testing a dyed velvet collar for a man's coat, the ideal contacting substance would be a man's collar. In other words, the expectancy of contact should guide the testing, and in the very earliest report of the Committee, Dr. Meyer pays attention to that: that the material expected to contact the dyed substance should be the one used in the test.

Mr. George A. Moran: In regard to Dr. Appel's comment about the Chrysophenine, there are three standards of wash fastness. One is for fast to laundry treatment, for which a vat color was adopted as the standard. The second is a standard of tub fastness for which a diazotized and developed color was adopted. Originally, there were four classifications. The third one came as moderately fast to washing treatment at about 120 for which a basic dyestuff was adopted. Later, this one was dropped out, because it was considered impractical to educate the public to the point where they would discriminate between four classes of fastness tests. So, when this was dropped out, there was only left the lower one, the fourth class, which is commercially fast, and for which Chrysophenine was adopted as the standard.

The standard is taken as the lowest degree of fastness which will pass the test, and this test is only 105 degrees. Of course, no direct color is fast to washing, but there is a considerable difference between different direct dyestuffs. Chrysophenine, of course, is one of the poorer ones. There are some that are better. But the fastness of direct dyestuffs is to a considerable extent dependent upon the strength at which they are dyed.

In this particular case, the standard is taken at one per cent, which possesses a moderate degree of fastness—not especially fast, but it is commercially fast. It was intended to cover the class that is known as commercially fast in the trade. That has a very well recognized standing, and has had, for years. It means that the color has only a very limited fastness and Chrysophenine covered that.

Chrysophenine has been used, and is used at the present time, in a very large way for goods that are turned out as commercially fast, and any delivery that is dyed with that is always accepted by customers as being such. That may not be fast enough to suit the requirements of the public if they take notice of fastness, and perhaps a color of a little higher degree of fastness may be an advantage over Chrysophenine, but as things have been accepted up to the present time, that has filled a recognized class between the mills and the buyers of their goods. No one ever returns goods because of that color not being commercially fast.

With regard to the mills supplying the requirements of the public and not being entirely familiar with what the public wants, I think the mills and the dyers are fairly familiar with what the public wants. They give the public what it wants. The reason they don't give them anything better is that the public doesn't demand it, and as soon as the public does demand it, they will receive whatever they call for. If they don't want to accept that degree of fastness, and call for something better, they will get it. I don't think there will be any difficulty on the part of the mills in supplying them, but the mills, naturally, supply the thing that looks best and that apparently satisfies the public, and from which they receive no criticism.

Dr. Harold: With regard to Chrysophenine, I think there is a matter that should receive strict attention, and that is the difference between lack of fastness and tonal change. Chrysophenine, if dyed in an acid bath, will, of course, when put in soap have a distinctly tonal change, without true loss of fastness. You get red values in your bath with acid bath. If, however, Chrysophenine has been applied in a soap bath, then it will be on the greenish cast of fastness.

A great deal of what we call lack of fastness is due to the fact that most of our dyestuffs are indicators, and if they are dyed in acid baths, they are going to show some tonal change in soaping. It depends on how clever and alert the eye is as to whether that tonal change is going to be apprehended or not. I do believe for all dyeing done under acid conditions, some distinction ought to be made in the test between that tonal change which will take place in the soap solution, even in the cold, and that which is due to a true scouring. Chrysophenine is especially sensitive, if dyed in an acid bath, to a tone change in soap, wholly apart from its scouring reactions.

Mr. Moran: I am not inclined to think that the public would be very much interested in a moderate tone change, if the color doesn't bleed out and stain the other fabrics that happen to be in the washing along with it, and if it doesn't lose much strength, because the public will rarely notice a moderate change in shade. When they send a garment to be washed to a laundry and it comes back, they can't very well carry in their eye any moderate change.

If you adopted another direct dyestuff possessing considerably better fastness than Chrysophenine, and dyed it a considerably stronger shade, it would have no better fastness. For instance, a four per cent dyeing of a direct dyestuff which possessed very good fastness for direct dyestuffs would not be as good as Chrysophenine at one per cent. So the percentage that is used for the standard is a rather important consideration. The present standard apparently passes the test that is laid down, which is 105 degrees, which is a very slight treatment.

Chairman Freedman: I might say here that one of the most perplexing problems confronting the successful application of these recommended commercial standards—one of the most perplexing problems to the dyer—is that of evaluating fastness. Under fastness we might consider fastness to crocking or rubbing, to cleaning, dry and wet, to pressing, to laundering, to perspiration, to light. To evaluate the degree of fastness is as I remarked before, exceptionally difficult. To set up standards for them is a difficult problem.

The degree of intensity of the dyed fabric, I should judge, would have a lot to do with the evaluation of the specimen. It would seem to be necessary to develop standard specimens made from materials dyed with a range, or a varying percentage of dyestuffs. You not alone have a change in color intensity, but also a change in hue. I wonder if Dr. Pierce would like to elaborate upon that subject.

Dr. Pierce: That seems to be a very important point. I was just reading the new issue of the American Dyestuff Reporter, and I see that the German Echtheits Commission has decided that they should have different strengths of dyeings for light fastness. That would be equally true of the crocking test. A heavy dyeing is going to crock more than a light one, so we will have to make provision in some way to take care of the light shades, although you are very seldom interested in whether or not a light color crocks; it is generally a heavy shade; it is also dependent upon the finish that has been put in the goods.

I recall that a number of years ago there was a concern outside of Philadelphia, John and James Dobson—they are out of business now—who made a great deal of silk plush which was used as collars on men's overcoats. It was dyed entirely with logwood and fustic, and it crocked badly. Then one of their dyers found out by accident one day that if you ran this pile fabric through a fairly weak solution of gum tragacanth and dried it on, it wouldn't stiffen the fiber but would eliminate the crocking almost entirely.

That is being used today on mohair fabrics. Mohair fabrics used for upholstery purposes are always complained of; they crock, but if you take a piece of undyed mohair and subject it to the crocking test, you get a discoloration on your white rag. You will observe, under a microscope, that mohair fiber has scales on the surface, not like wool, but more like a scurf or dandruff, and when it is dyed, these particles are dyed also. When you rub it, you rub away part of the fabric, it comes off, and gives all the appearances of a crocking test.

So we have to be very careful in our judgment on these things.

Another thing we have to watch out for is admitting freak tests which will favor some particular party in interest. They must be general.

To give a specific instance: Before the war, almost all of the olive drab for the United States Army was dyed in two or three mills, and they all bought their dyestuff from a concern which held the business and received high prices for the dyes sold. Why? Because the United States Government had incorporated, through the suggestion of somebody, two tests, called the lactic and citric acid tests.

The fabric remained in ten per cent citric acid for twenty-four hours, and also in U.S.P. lactic acid for twenty-four hours. It was then washed and neutralized, and was not allowed to change. We were able to get a yellow—practically any of the good Chrome Yellows would answer—and Alizarine Blue Black B was the other component, which was perfectly all right, but when it came to finding the reds, we found that Alizarine Red WS wouldn't stand at all.

We found that Direct Fast Red F on the chrome mordant and after-chrome wouldn't stand at all. We had some of Geigy's Erio Chrome Red B, which was an excellent product. That wouldn't stand. There were just two reds that would stand: Chrome Fast Red G, and Chrome Fast Red R of the Berlin Anilin Works. I don't believe the people in the Berlin Anilin Works knew it themselves, but this dealer knew those two reds would stand, and he had them in his mixture. Everybody else in the dye business was excluded from the business on government contracts just because of a strict specification that the government had put in.

When the war came on, we couldn't get the colors any more. The government not only dropped the lactic and citric acid tests, but they permitted the addition of cotton and let down the bars considerably. Otherwise, our troops wouldn't have had any uniforms to wear. So I say we have to watch out that no parties in interest want a particular test adopted that will pass one certain line of goods and exclude the others.

The mill people are very much excited over this work that you are doing. They are very much excited over what happened at the Hotel New Yorker a few weeks ago, and it has stimulated considerable activity.

Naturally, the dyestuff people are pleased. We like them to use good fast colors, but it is just too bad for them if the grade of goods that they have been making is going

to be put out because of too severe restrictions. That is their living. They feel very badly about it. So I don't think we want to be too severe on them right away. I think the thing will adapt itself in the course of time.

I am very glad to say that some of the concerns are putting out women's dress goods now which will stand the most rigid specifications, just equal to what you apply to men's wear, but not all of them. A good many of them are excellent concerns, are making good materials, but they will use cheap acid dyes on women's wear, and it is going to be a terrible blow to them to have to use very expensive colors to meet the high standards that you are setting for them. I don't know what we can do to help the situation, but that will have to work itself out in time.

Thank you.

Chairman Freedman: Dr. Pierce, I would like to say that the matter of rating or of setting standards has been left out of these recommended commercial standards for woven dress fabrics, until such time as we find, first, that laboratories and others are talking a common language. I mean by that, using the tests as described here, or that there are a sufficient number of them equipped to do so, and, also, that they are reporting in that way.

I believe Dr. Douty brought the next step out very ably, when he said that that information on standards, or what the consumer demands were, would have to come from consumers and others interested.

Your remark that some manufacturers are producing woolens that are satisfactory in so far as consumer requirements are concerned is very heartening, and it might be well for those mills who have been turning out the other type of merchandise to be prepared to fill the consumer requirements as they develop. It is too bad that they have been doing these things in the past. I don't think it is anything to be very proud about.

Of course, the demand hasn't been here up to the present time, or there hasn't been sufficient demand for knowledge or for consumer knowledge, but there is a steadily growing demand all over the country for more factual information. It has been my one great desire to help detechnicalize and simplify this information so that consumers would not ask for impossible things. I think we technical men and women can do these things for the mill man, the dyer, the dyestuff man and the retailer and the consumer as well.

I feel that the mill man also has his responsibilities, and I think that it is up to the man in the mill to be prepared, the man in the dyehouse, to furnish that information when a demand for it becomes apparent.

Are there any further questions on this subject?

Dr. Harold: I would like to say something that should be said, and I know it isn't going to be said, because the men behind the guest table feel that modesty keeps them from referring to it, but I think that this organization ought to be proud of the wonderful work that Dr. Douty, Dr. Appel and Dr. Freedman have done to develop protection for the customers and the consumers' side of this case.

These men are too modest to refer to the work that they have done, but for the past few years, they have done wonderful pioneer work, and I think if the American woman gets a fair deal in the future, it will be largely due to the efforts of these three gentlemen in informing her just what is available. It is a matter, of course, of instruction of the consumer. It is not that the consumer hasn't wanted better stuff. In the mere matter of shrinkage, a woman could have had a shrink-fast garment and fabric for the last fifty years. All it meant was that she would have to pay for the ten per cent shrinkage or the fifteen per cent shrinkage.

The manufacturer didn't want to charge her with that. He would rather take a hundred yards, pull it out to 110 yards, cut off ten yards, sell it as mill ends, and add it to his profits. When the goods were returned to the American woman, to the consumers, of course they shrank; they had to.

As Dr. Douty said, these improvements were always available if the final consumer was willing to pay the price. If the mills and the people who contribute the various factors to textile perfection knew that, after all, the American woman is willing to pay the price if she is properly informed, I think a real reform would be made all through the industry.

Perhaps the key to it is better training in the home economics courses in our various schools. The girls take that course, even if the boys don't. But as the girls do most of the buying anyhow—I think it amounts to about eighty per cent of the purchases—it seems to me that this is a fertile field for instruction. If the American woman is really told what she can get if she insists on it—and I think the home economics courses can give her that—I think we will have the key to the improvements.

I must say that I don't think the mill owner and the manufacturer are going to be over-anxious to give her anything better, if they aren't quite sure that she will insist on it, because they have two phases of the woman to deal with: Her first urge is to buy cheaply, and her second urge—and perhaps a very bad second—is to buy good goods, and they have to play up, naturally, to that first interest. They have to consider her desire for cheap goods, and you can't blame them if that is the main argument given to the consumer to get a thing cheap.

If we instruct her through the home economics courses and give her the desire for good materials, she will certainly get them. But in order to do so, we will have to correct these home economics courses which are still saddled with a great deal of ignorance. There are home economics courses in which women are still being taught

that coal tar dyes are no good, that the good old Alizarine, and the good old natural indigo used in the Chinese or Turkish rugs are much better. These and other old-fashioned superstitions are still being taught by poorly informed teachers in home economics to the girls of the country.

If our organization could inform the teachers of home economics throughout the country, the American woman would be in a position to expect to pay good prices for good goods. That is the key to the reform.

Chairman Freedman: I might say that in the metropolitan district there is an aroused consumer demand for better merchandise, and in so far as the home economics courses are concerned, where some years ago we only had classes from the colleges coming to visit Macy's Bureau of Standards, we now have classes from high schools, and even from elementary schools. In other words, children in the elementary schools are being taught how to evaluate merchandise. That is something to give serious consideration to.

Mr. Baxter: In setting up these various standards, you have the converter to think of, in this respect; that he is having a very tough time to make a living today, and he is only interested in two classes of colors. Those two classes are the commercial class and the class of colors which the dyer will guarantee and stand behind in case there are any claims, which limits that class, necessarily, to vats or naphthols for the average finisher.

Chairman Freedman: There being no further comments, I want to take this opportunity of thanking Dr. Appel and Dr. Douty for their splendid presentations of their subjects this evening.

NINETY-SIXTH MEETING OF THE RESEARCH COMMITTEE

THE 96th meeting of the Research Committee was held in the Engineers' Club of Boston on Friday afternoon, November first. Present were Chairman Louis A. Olney, presiding; W. D. Appel, J. R. Bonnar, W. H. Cady, Hugh Christison, H. D. Clayton, R. E. Derby, C. Z. Draves, W. C. Durfee, H. F. Herrmann, E. C. Knaeble, H. W. Leitch, J. G. Masson, W. R. Moorhouse, G. A. Moran, D. H. Powers, R. E. Rose, B. A. Ryberg, W. M. Scott, Ben Verity and H. C. Chapin. Regrets were received from Alban Eavenson, P. F. Haddock, E. H. Killheffer, Hans Meyer, Claxton Monro and A. R. Thompson, Jr.

It was voted that, "Analytical Methods for a Textile Laboratory," to be revised by Dr. Scott, be reprinted. After a discussion as to what features of the Year Book should be omitted from the next edition to make way for new material, it was voted that the new material be added rather than substituted.

Mr. Appel reported for the Sub-Committee on Chemistry of Wool Fiber, of which Alban Eavenson is Chairman, describing extensions of Dr. Harris' work made possible through assistance of Dr. J. A. Crowder supported by the Chemical Foundation, and Mr. Arthur L. Smith assigned to Washington by the Eavenson and Levering Co.

It was announced that a conditional offer of $2500 for research secured by Mr. Hathorne, Chairman of the Rayon Committee, from the Throwsters' Institute had been made available through the contribution of an equal amount made by the Textile Foundation to the American Association of Textile Chemists and Colorists.

Mr. Cady reported on the work of Dr. Glarum upon printing pastes, and Mr. Christison reported excellent progress in Mr. Ryberg's work on analysis of fiber mixtures.

A letter from President Alexander Guerry of the University of Chattanooga, thanked the Association for choosing Chattanooga as location for the work on mercerizing, and announced the appropriation of $500 by the University for materials and equipment to be used in the research.

Mr. J. R. Bonnar reported for Dr. Meyer's Sub-Committee on Crocking Tests, showing pictures of a German testing machine invented by our member Dr. Krais, and submitting samples of silk and wool standards from Dr. Meyer. Mr. Appel showed a machine built at the Bureau of Standards in Washington. Mr. Christison advocated abandonment of the term, "crocking", as indefinite, and substitution of the terms, "dry rubbing", "wet rubbing", and "bleeding".

Mr. Appel and Mr. Christison reported diversely on recent, "General Conferences on Woven Dress Fabrics;—Testing and Reporting". A suggestion regarding standards for throwsters' tints was tabled, on the ground that these might better be settled between dye manufacturers and throwsters. In response to a request from the American Society for Testing Materials, Dr. W. M. Scott was appointed representative of our Association to cooperate with the A. S. T. M. Sub-Committee on Water.

Respectfully submitted,

H. C. CHAPIN,
Secretary.

APPLICANTS FOR MEMBERSHIP

Active

John E. Fite, Jr.—Secretary, Krout & Fite Mfg. Co., Philadelphia, Pa. Sponsors: J. H. Grady, J. F. X. Harold.

George W. Grant—Textile Chemist and Colorist, E. I. du Pont de Nemours & Co., Wilmington, Del. Sponsors: G. H. Schuler, C. A. Seibert.

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Ernest J. Chornyei—Assistant Dyer, United States Finishing Co., Pawtucket, R. I. Sponsors: F. A. Stubbings, Frank Puleo.

George W. Little—Chemist, United States Finishing Co., Providence, R. I. Sponsors: P. J. Choquette, W. S. Cady.

Laurie Ellis Whittelsey—Dyer, Macon Textiles, Inc., Macon, Georgia. Sponsors: J. I. White, H. W. Field.

ONE HUNDRED AND THIRD COUNCIL MEETING

THE Council held its one hundred and third meeting in the Engineers' Club of Boston on Friday afternoon, Nov. 1, 1935. Present were President Robert E. Rose, presiding; William H. Cady, Vice-President; William R. Moorhouse, Treasurer; Louis A. Olney, Chairman of the Research Committee; William D. Appel, Hugh Christison, Carl Z. Draves, Henry F. Herrmann, and Donald H. Powers, Councilors-at-Large; Roland E. Derby representing Northern New England, Ben Verity representing Rhode Island, Eugene C. Knaeble representing Philadelphia; and Harold C. Chapin, Secretary.

It was voted, in accordance with the plan adopted at the ninety-ninth Council meeting, that the Annual Meeting of 1936 be in Providence, and that of 1937 in Philadelphia.

Alex. Morrison and Dr. Walter M. Scott were appointed to audit the accounts of the Treasurer and Secretary. R. M. Covington as Chairman, E. E. Fickett, and E. C. Knaeble were appointed to count ballots at the Annual Meeting. A. P. Howes, Dr. Louis A. Olney, and the Secretary were appointed a committee to act on some form of symbol to designate Corporate members in their advertising.

The Sub-Committee on Mercerization was voted an additional appropriation. The Sub-Committees on Methods of Determining Oil, Soap, and Other Extraneous Matter in Textile Materials, and on the Determination of Fibers in Mixtures, were authorized to make expenditures, subject to approval of the Research Committee Chairman, within the sum allowed to the Association by the Textile Foundation for these purposes; this being in addition to the $500 originally voted these committees out of the Re-

SECRETARY'S BALANCE SHEET

October 31, 1935

	Applications	Dues, Regular and Re-instate.	Dues, Sustaining and Contributions	Dues, Corporate	Miscellaneous	Bank Charges	Totals net
Received by Secretary, Nov. 1, 1934, to June 13, 1935.....	$1,137.50	$5,997.25	$245.00	$1,925.00	$1,119.35	—$2.83	$10,421.27
Received by Secretary, June 13 to to Oct. 28, 1935.....	307.50	62.50	.....	.....	339.64*	— .25	709.39
Total received	1,445.00	6,059.75	245.00	1,925.00	1,458.99	— 3.08	11,130.66

Books closed for fiscal year on October 28, and balance transmitted to Treasurer.

***Miscellaneous**

Year Book, receipts through Howes Publishing Co.	$134.48
Year Book, sales and postage.....	99.45
Analytical Methods	34.31
Dyestuff Reporters	11.70
Carbonizing Reports	12.89
Silk Standards	2.12
Knitted Tubing	20.69
Launder-Ometer Royalties	24.00
Total	$339.64

search Fund of the Association. The present allowance to the Secretary for assistance and compensation was voted continued.

Each of the following was elected to the class of membership specified, as of thirty days from publication of application, provided no objection be received before that date by the Secretary:

Active

G. L. Atkinson	C. A. Dupré	W. M. McCann
Abraham Brandt	W. J. Emhart	W. T. McWhorter
Gay M. Brinn	C. R. Ewing	F. F. Myers
M. H. Busfield	H. C. Hatch	G. W. Prater
Paul H. Cate	J. A. Hunter	J. J. Reutlinger
H. R. Childs	E. H. Huntress	R. R. Seiler
W. A. Diamond	E. W. Klumph	A. R. Stiles
D. F. Driscoll	W. D. Marshall	L. R. Waddey

Junior

W. E. Brand	J. L. Hart	George Pappas
	George Rock	

Associate

John Bennitt	C. Hachikian	W. A. Levins
Maxwell Cone	H. A. Harrison	F. A. McWilliams
G. W. H. Endler	R. F. Holoch	T. F. O'Brien
J. F. Fairman	H. B. Kinsinger	A. S. Robinson
C. W. Gilchrist	C. F. Klebsattel	W. R. Sargent
M. A. Grimes		

Student

R. T. Clarke	C. E. Lincoln	R. E. Rettew
A. B. Elam, Jr.	W. J. Manning	R. H. Teeter
J. W. Furr	G. M. Oliver	P. S. Valentine

O. C. Bacon, J. M. Booth, H. B. Fenn, Jr., and Daniel McHugh were transferred from Junior to Active membership.

Respectfully submitted,

H. C. CHAPIN,
Secretary.

MEETING, SOUTH CENTRAL SECTION

THE South Central Section held its regular Fall meeting at the Read House in Chattanooga, Tenn., on Oct. 12th.

Regular business of the Section and plans for the coming convention were discussed.

Noel White, former chairman of the Section, spoke on his recent travels in Central and South America.

S. I. Parker of the Ciba Co. was the principal speaker of the evening. His paper on "An Outline of Cotton Printing" was very interesting, and a lengthy discussion followed.

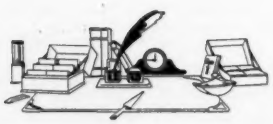
Harold Schroeder, chairman of the South Central Section presided.

Thirty members and guests were present.

A rising vote of thanks was extended Mr. Parker.

Respectfully submitted,

H. B. KIMBRELL,
Secretary.



AMERICAN
DYESTUFF
REPORTER

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Published biweekly by
HOWES PUBLISHING CO., INC.
440 Fourth Avenue, New York City

Subscription price: $5.00 per year; Canadian $6.80; foreign $6.00

Vol. XXIV December 2, 1935 No. 24

AGAIN WE MEET

THE fifteenth Annual Meeting of the American Association of Textile Chemists and Colorists convening in Chattanooga this week-end represents the completion of another year of research accomplishments and the start of still another year of problems to be faced, analyzed and solved.

Ever under the guidance of capable officers and committees the record of this association has been one of valuable contributions to the textile industry since the time of its inception and we look forward to a continuance of such favorable progress. There is much that remains to be done and it is only by the concerted action of an enthusiastic membership that a continued service to the industry can be realized. We believe that the persons who are members of the association have the proper enthusiasm and spirit of cooperation to carry out the objects of the association—"to promote increase of knowledge of the application of dyes and chemicals in the textile industry; to encourage in any practical way research work on chemical processes and materials of importance to the textile industry and to establish for the members channels by which the interchange of professional knowledge among them may be increased."

If anyone doubts that the association has accomplished a great deal for the textile industry during the years it has been functioning, he needs but look over the published papers which have been presented before the local and national meetings and the various year books which have been prepared.

On the occasion of its Annual Meeting the AMERICAN DYESTUFF REPORTER wishes the American Association of Textile Chemists and Colorists continued success in its endeavors in the textile wet processing field.

APPRECIATION

TO each member of the A.A.T.C.C. who will read this while attending the Annual Meeting in Chattanooga we wish to point out that everything possible has been done by the various committees to make your visit to Chattanooga as profitable and as enjoyable as possible. The technical program is exceptional and the local committees have insured that the social aspects will not be neglected. You have had an opportunity to read abstracts of the papers to be presented and you should be prepared to get the utmost from each presentation.

While every effort has been made so that you will come away from Chattanooga feeling that it was worth while, it will prove successful for you only if you take full advantage of all that has been done for your benefit. It is the only way in which those who have worked to make the meeting of value can realize that their efforts have not been in vain. Show your appreciation of their labors by making the most of your stay in Chattanooga.

TECHNOLOGICAL UNEMPLOYMENT

SO far as, from my somewhat limited outlook, I can see the situation within the United States I cannot find any evidence that technological unemployment can fairly be made the goat for the present situation to any appreciable degree. Distressing individual cases occur and greatly distort the perspective of writers who come into contact with them and who do not see the counter-balancing gains. The complaint long antidates the scientific age, and I think a little reading of history shows that it has always been enormously overdone. In general, the writer who complains about it is too close to a given situation to see what is happening on the whole . . . In the United States we have indeed displaced an enormous amount of farm labor within the past century. If we had not done so I myself would be really usefully employed now in milking the cows and bedding down the horses rather than in expressing unimportant views at this dinner. I myself don't feel injured by the change nor do most of the other farmers who have left the farm, since they don't seem to want to go back. A few years ago I quoted here in New York, statistics from the U. S. Census, that seem to me to tell the long range story in the United States pretty dependably. These statistics show that the actual percentage of the population "gainfully employed" has slowly increased decade by decade from 34.7 per cent in 1880 to 39.8 per cent in 1930. This seems to show fairly conclusively that in this very period in which our technical advances have been most rapid (1880-1930) those thrown out of one industry have rapidly been absorbed into others, *and then some*, since the actual percentage keeps on increasing. . . .—DR. ROBERT A. MILLIKAN speaking at the Annual Banquet of the U. S. Institute for Textile Research.

Uneven Dyeings—

(Continued from page 670)

aspect through de-oiling and washing, then soiling after dyeing is to be assumed; and, in fact, in most cases, this will be the true reason, since, in the plant, with work going on without proper care in general, and working with dirty or excessively oiled machinery, opportunities for the contracting of soiled spots are ideal.

Attention may also be drawn to the following situation. If the contaminants in the yarn contain rust or iron or other metallic substances, as is usually the case, and the finished goods are bleached with peroxide, before dyeing in delicate tones, the wool at such points will become yellowed through over-oxidation, as a result of catalytic action of the metallic substances upon the peroxide; yellowed, and tendered, and will dye in much darker tones at these points. In such cases, then, either during the dyeing, or later, during the finishing (stretching), holes in the goods will appear, for which the dyer is not responsible, since it is not customary, as a point of normal working, to sour off goods before dyeing, as a precautionary measure, for the removal of harmful metallic contaminants, etc., which should not be there anyway.

The above applies particularly to woolen goods. But similarly numerous are the causes which lead to this involuntary two-tone dyeing or "singed" spots, in cotton goods. With this fiber also, either undyed yarn is stretched and dyed as yarn, or as piece goods, or as hosiery.

For cotton goods, beside common, single yarns, mercerized and twisted material is used. With the latter materials, we not infrequently observe "singed" spots, that is, as before, shorter, darker portions of filament, or darker spiral filaments, at more or less uniform intervals, as well as evidently stretched portions, level as to their own tone, but darker or lighter than the standard tone, in one and the same piece or run. In undyed material the fault seldom is evident; it comes to light usually only upon dyeing the goods.

The author has carried out comparative work upon six different sorts of cotton yarn, of known origin. After examination under ultra-violet light, each lot was divided into four parts; one of which was left untreated, another boiled out for two hours at ordinary pressure with 5 g. of caustic soda and 5 g. of soda-ash per liter; a third was similarly treated and then bleached white with hypochlorite, and the fourth, after the same alkaline boiling-out, mercerized without tensioning. All of the samples were then dyed together with Diamine Blue FF, with a little soda and Monopole soap added, to a light blue. The results were as follows: the untreated material dyed the lightest shade, the boiled-out material dyed a deeper shade, the bleached lots dyed still more deeply, while the deepest dyeings were obtained upon the mercerized goods. Apart from the action of the mercerization, the purification of the fiber is of favorable influence, in the lightest-colored material (the bleached) was dyed most deeply. The rest, the darker (naturally darker) raw yarn did dye to a somewhat duller tone, but not in every case was the dyeing deeper in tone; that is, in practical work, yarns of a lighter color in the raw state can, under some circumstances, be dyed more deeply than others with a darker color in the raw state.

No very uniform conclusions could be drawn from consideration of the sources of the raw material, as to the depth of dyeing, though in the particular materials used there were some interesting differences noted. But, apart from the mercerized material, the number of the yarn, or its twist, was apparently of some influence; the more loose the composition of the yarn, the deeper the dyeing. But, as to the mercerized material, the more strongly twisted yarns, with higher number, were dyed more deeply.

Altogether, the experiments showed that the different sorts of cotton do possess different degrees of affinity for dyestuffs, and are able to afford dyeings of different degrees of depth of tone, if yarns are worked up together which are of the same number and twist, for example, but which have been spun from different sorts of cotton, or have been made up from different spinnings, or from deliberate mixtures. Further, these differences in the affinity for dyestuffs cannot fully be compensated for by the different treatments of the fiber before dyeing (alkaline boiling-out or kiering, mercerization, bleaching), nor by any precautions taken in the dyeing itself (addition of wetting-out or levelling agents). Yarn-number and twist have their influence upon the depth of tone of the dyeing, that is, upon the optical effect of it. So then, the dyer cannot be held responsible, if, in the dyeing of cotton in the piece or run, or as hosiery, darker or lighter local effects, streaky, spiral, or "singed," and sharply defined in location, occur.

Very often, goods produced from mercerized yarn are sent in to be dyed; when the above defects come to light, it is a matter of doubt whether the mercerizer or the dyer is at fault. It cannot be at all doubted, that such defects can be caused before and during the mercerization. The following factors are important, in this case:—

1—Non-uniform boiling-out of the yarn, as a consequence of improper loading of the kier, and insufficient circulation of the kier-liquor. The yarn then displays an uneven wetting-out quality when mercerized.

2—Variation in the moisture-content, that is, partial but irregular drying out of the yarn, which results in a varying speed of reaction with the mercerizing liquor.

3—Unskillful arrangement of the skeins upon the mercerizer-rolls, that is, insufficient spreading out of the goods, so that the liquor does not penetrate uniformly. In the thicker layers, dissimilar tensions are set up, and consequently uneven mercerization takes place.

In all these cases, as a result of uneven wetting-out, wetting-out at a non-uniform rate, and varying tension, differences in the degree of mercerization arise, which lead at once to lack of uniformity in the depth of tone when dyed. In general, the lighter and the darker filaments, or portions of them, show no essential difference

in luster, or in the microscopic aspect of the cotton fiber.

In many cases, however, the mercerizer, too, is not to blame. The various sorts of cotton often mercerize to a different extent, under the same conditions; and the view that differences in affinity toward dyestuffs can be adjusted through mercerization or through some milder treatment with caustic liquor is not at all justified, as a general statement. Besides this, the twist of the yarn is of great influence upon the degree of mercerization. We can often observe that the less twisted portion in a yarn appear lighter after mercerization and dyeing, or that, in the twisted material, a particular filament will be thin, smooth, strongly twisted, and dark, while the other filament, at the same point, will be thick, pubescent, less strongly twisted, and light in tone. Through uneven tension of the filament in the working up of the yarn it often happens that individual filaments in a strand are longer, and therefore are less stretched during mercerization, and so will dye to a tone different from that taken on by a filament, say, normally stretched in the mercerization. Finally, there come from the spinner, now and then, strands which are too loosely composed as to filament-content, so that, in mercerization, they cannot be spread out evenly to a sufficient degree at these points of irregularity of structure. As a consequence of the shrinking of the matted fibers at these points, these parts become much thicker during mercerization. The caustic penetrates at such points more slowly and unevenly, and the tension set up in the region of such points is irregular, according to the degree of mercerization, which naturally leads to dyeings of unequal depth of tone.

When goods dyed in the piece come out unevenly dyed in the ways under discussion, the dyer cannot be held responsible; the cause of the trouble is to be sought in the physical characteristics of the cotton, of the yarn itself, or in the method of treatment before or during mercerization. Through study of the dyed goods, completely finished, the cause of these defects can no longer be determined definitely. If such a defective piece of goods is stripped, mercerized (re-mercerized if already so treated) without tension, redyed, and comes out dyed level, one can decide then only that the physical characteristics of the cotton alone are not the cause of the trouble.

And, lastly, a product displaying the above defects may be obtained when common or mercerized yarn is dyed before finishing. In this case, too, the most varied causes must be sought for—the working up together of yarns from different spinnings or from different sorts of cotton (difference in affinity for dyestuffs), differences in the yarn-number or twist, faulty composition of the strands (loose or short blending), errors in boiling-out or kiering, and mercerizing, the working up together of yarns from different dyeings, and non-level dyeings because of improper dyeing itself. In all these cases it is rarely the dyer who is at fault; it is almost always the mercerizer.

● CHEMISTRY AND RECOVERY

The desire for economic self-sufficiency manifest in many nations during recent years has placed the chemist in high esteem in Government circles and reports reaching the Department of Commerce from foreign countries indicate that this confidence has not been misplaced.

Germany, having only limited quantities of many natural products and finding it difficult to obtain such supplies in sufficient amounts abroad, owing to exchange difficulties, has leaned heavily upon the chemist to make up the deficiency.

As a result Germany is today producing a long list of chemical substitutes for natural products including artificial silk, cotton, and woolen fibers, rubber camphor, dyes, fertilizers, perfumes, flavors, medicinals, motor fuels and a host of other commodities. Only 60 per cent of the motor fuel consumed in that country for example is now obtained from petroleum, the balance coming from potatoes and coal.

This movement has been by no means confined to Germany. Practically every synthetic or substitute material produced in that country is also being manufactured by other industrial nations. England with its large resources of coal is producing synthetic gasoline from that product, Italy is making "artificial wool" from casein, which is obtained from skimmed milk, Japan with little skimmed milk available is making casein from the liquid produced in processing silk and both China and Italy are using wood and charcoal as motor fuel.

While many synthetic products do not compare or are not as desirable as natural materials, some are even superior for the purpose which they serve, it is claimed.

● MACHINERY EXHIBITION

The Textile Recorder Machinery and Accessories Exhibitions Ltd. of Manchester, England has been organized and is actively engaged with future exhibition policy.

The success of this organization is said to be assured by the very nature of its composition. Its members (as shareholders) already comprise the majority of those firms most actively interested in exhibition work from every important section of the textile machinery trades in Lancashire, Yorkshire and the Midlands. It has the support also of the Textile Machinery and Accessory Exhibitors' Federation.

The trade can now decide when and where exhibitions shall be held and can control their organization. It is stated that under such conditions the standard can be steadily improved until the exhibitions of textile machinery in England not only reflect the importance of the trade but touch a point of exhibition excellence never before reached.

The first exhibition to be organized by the new company will be at Leicester in October 1936. The plans and literature will be available very shortly.

● COMMITTEE D-13 PROGRAM

A.S.T.M. Committee D-13 on Textile Materials has an extensive program of work to be carried on during the next year. The subcommittee on cotton and its products will make efforts to stimulate interest in the methods for measuring cotton fiber properties, and to foster opportunities for making comprehensive check on results obtained by a given method in different laboratories. It is planned to stimulate interest in the work of the subcommittee on raw cotton, on the part of cotton breeders and other agricultural workers in the United States, as well as technical workers in the field of home economics who are interested in the quality of consumer cotton products as inferred by the properties of the raw stock.

Work is under way to develop a device for measuring, under uniform tension, the yardage of cotton yarns or threads on a cone or package and also to determine the yards per pound of thread. The proper conditioning time for sized and waxed thread is also being investigated. The work on tire fabrics involves the study of the calibration methods and an investigation of the newly approved constant specimen rate of load type of testing machine. In the field of narrow fabrics the committee is giving consideration to the development of test methods for typewriter and similar ribbons.

The subgroup on rayon is planning to develop performance tests such as unraveling and fraying of rayon fabrics, etc.

The subcommittee on wool plans to study methods of classification of wool fibers and to develop test methods and specifications for wool felt and fabrics. Work will be done on chemical and physical utility tests for pile floor covering.

Other projects which are being developed include a test method for magnetic iron in asbestos textiles and determination of electrical resistivity of these materials.

The subcommittee on silk in collaboration with the subgroup (B4) on bleaching, dyeing and finishing is working on the development of methods of testing dye fastness of silk and rayon broad goods to washing and light. Subcommittee B-4 plans to promulgate tests for determination of sizing and finishing materials in cotton fabrics and the evaluation of detergency of soaps.

The subcommittee on methods and machines has a number of projects under consideration:

Section II on Machines.—For immediate consideration, calibration method for horizontal testing machines of the pendulum type; specifications for jaws of the flat grip type; and for bursting testers. For future consideration, the development of specifications for textile testing machines such as twist and crimp testers, yarn reels, sizing scales, drying ovens, thickness gages, etc.

Section III on Humidity.—Desirable tolerances in temperature and relative humidity in defining standard atmosphere; rate of moisture pickup and time for specific materials to reach equilibrium in standard atmosphere; data on regain of various materials in equilibrium with specified temperatures and humidities; "standard regains" for buying, selling and testing of specific materials; effect of regain on physical properties; methods of measuring regain.

● CIBA RELEASES

Ciba Company, Inc: makes announcement of the release of the following circulars and sample cards:

Ciba and Cibanone Colors, Micro Powders in Printing—a card illustrating 5 two color prints on cotton fabric. The Micro Powders are said to be of considerable interest for textile printers as it is claimed that they excell all similar products now on the market in wetting-out qualities and dispersion which properties insure that their color yield in printing will not be retarded. It is also said that they may be used in printing without previous reduction. Advantages claimed over vat dyes in paste form include freedom from drying out, settling and freezing which advantages enable them to be stored almost without limit. The following Micro Powders are described: Cibanone Yellow GN Micro Powder, Cibanone Golden Orange 2RN Micro Powder, Ciba Brown G Micro Powder, Ciba Blue 2B Micro Powder, Cibanone Blue GCD Micro Powder, Cibanone Navy Blue RA Micro Powder, Cibanone Violet 4R Micro Powder, Cibanone Violet 2RB Micro Powder, Cibanone Grey G Micro Powder and Vat Printing Black BL Micro Powder. Sample Card No. 1246.

Naphtols and Bases—a card illustrating Ciba Naphtols RF, RP, RBL, RN, RA, RC, RT, RPH and RK in combination with the bases Orange Base Ciba II, Scarlet Base Ciba I, Scarlet Base Ciba II, Scarlet Base Ciba IV, Scarlet Base Ciba V, Scarlet Base Ciba R, Red Base Ciba III, Red Base Ciba V, Red Base Ciba VI, Red Base Ciba VIII and Bordeaux Base Ciba II both in dyeing and printing. This sample card contains extensive practical working formulae and also a table of fastnesses. It is to be noted that the greater number of combinations have been patented by the Society of Chemical Industry in Basle. Sample Card No. 1000.

Dyestuffs for Hosiery, Dyed in the Boil-Off Bath—an issue of the Ciba Co., Inc. illustrating 28 acid dyestuffs, 14 direct dyestuffs and 14 Cibacete Colors. All the dyeings are on a special fabric knit in the manner of hosiery, but showing brands of viscose, mercerized cotton, silk and acetate. All the dyeings were made in the boil-off bath and show graphically the affinities of the dyes for each fiber, as well as any slight tint which might go on the other fibers. The collection is said to be ample for any hosiery dyer, for any class of work he may encounter.

● CORRECTION

In the Ciba Company advertisement appearing in the November 18th issue on page VI the caption should have read "Migasols PC and PJ" instead of "Migasols PC and PG."

OPEN FORUM

Rules under which this department of the REPORTER is conducted are as follows:

1. Anyone who has a technical problem on which he would like advice may submit it to the Reporter and it will be published in the first available issue.

2. Any reader who feels that he has a solution of the problem may forward his reply to us and if we feel that the reply is suitable it will be published in a succeeding issue.

3. For each such reply published the Reporter will pay a minimum of $2.

4. In case there is more than one answer to the same question, the one covering the subject in the most complete and authentic manner will be published, or if two answers are sufficiently different both will be published. If two answers are considered equally good, the one first received will be given priority.

5. The Reporter will assume no responsibility whatsoever for the accuracy of the answers submitted—it is simply offering a vehicle for the public expression of its readers' opinions.

6. Both the questioner and answerer must send in his complete name and address. When requested we will publish only the initials or other identifying insignia.

Correction

In the answer to question 29, page 641, November 4th issue, 1st line, second paragraph, which now reads "Prepare a cold bath of ½° Twaddle chloride of zinc" should read "Prepare a cold bath of ½° Twaddle chloride of lime".

Answers

31—Occasionally we experience difficulty with worsted and zephyr knitting yarns, in the dyeing of colors such as dark browns and similar shades. It seems that some of the skeins come up in an entirely different shade than others.

Upon checking after dyeing, we find that the darker skeins still contain oil, and after rescouring the dyed yarn, we manage to get a uniform shade. Our method of scouring is as follows:

In a 500-pound Klauder-Weldon dyeing machine, we use about 25 pounds of olive oil soap dissolved. (Weight of soap before dissolved.) Forty pounds of soda ash light 58 per cent, 10 pounds of ammonia, temperature from 100° to 120° F. Rinsing in 120° to 130° F.

This may all be due, of course, to the fact that yarn is steam-conditioned at the mill before it comes to us, and the oil becomes so set that it does not wash out freely.

Perhaps some of your readers can suggest a scouring formula different to that we are using, which will result in more uniform dyeings. Perhaps they may also be able to explain why such a variation occurs.—D. Y. B.

Answer No. 1—In the October 21st issue of the American Dyestuff Reporter, D. Y. B. in question No. 31 reports having difficulty in the dyeing of certain colors on zephyr and worsted knitting yarns. He goes on to state that some of the skeins come up in an entirely different shade than do others; and that on checking after dyeing he found that some of the off-color skeins still contained oil. Rescouring was necessary to obtain an even shade. His method of scouring was given as follows:

> **"In a 500-pound Klauder-Weldon dyeing machine, we use about 25 pounds of olive oil soap dissolved. (Weight of soap before dissolved.) Forty pounds of soda ash light 58 per cent, 10 pounds of ammonia, temperature from 100 to 120 deg. F. Rinsing at 120 to 130 deg. F."**

The writer has recently been working on a similar problem and found that the use of pine oil in the scouring formula was a tremendous help in obtaining even dyeings. Fine oil, or a good soluble pine oil containing 50 per cent or more of pine oil, seemed to have a solvent action on the oils present in the yarn and in general produced cleaner better-smelling goods. Tests on the yarns scoured with the pine oil formula showed less oil and (or) grease present, on extraction tests. For the first trial, replacing 5 pounds of the olive oil soap with 5 pounds of pine oil should show improved results. Of course, it is possible that less soap might be used, or perhaps the soda ash could be cut about 5 pounds. If a soluble pine oil is used it will be best to use enough to have present about 5 pounds of straight pine oil, and deduct an equivalent amount of soap for the amount of carrier present in the soluble pine oil. From these trial formulas no doubt a working formula can be derived.

If the trouble has been caused by inadequate oil removal in scouring, the use of pine oil will undoubtedly go far toward obtaining a full correction.—A. J. K.

Answer No. 2—The scouring formula you are now using should work satisfactorily providing the alkali is thoroughly washed out of the goods. However, this is sometimes difficult especially when soda ash is used, because this alkali is retained by the wool much more tenaciously than ammonia. The amount of soda you are now using seems to be excessively high. I believe you would get far more uniform results with the following formula:

40 lbs. Olive Oil Soap
20 lbs. Ammonia 28%

The amount of soap used should be enough to give

a "creamy" lather in order that the grease in the yarn may be thoroughly emulsified. It is not necessary to exceed 110° F. while scouring with olive oil soap. As a matter of fact, I believe that a more thorough emulsifying action is obtained at 110° F. with a low titer soap such as you are now using.

I do not believe that the steam-conditioning would cause the oil to set on the goods. The only point to be careful about is to make sure that the yarn has had ample time to wet-out and soften thoroughly during the scouring. Sometimes it is found advantageous to run about 10 minutes in warm water before adding the soap.

If individual skeins show an appreciable difference in shade as compared to other skeins dyed in the same batch and there is no unevenness, your trouble may be due to variation in stock. It is a proven fact that wools from different sources having the same fiber count and yarn count, and spun and twisted under identical conditions, show more or less variation in shade when dyed together in the same bath. Sometimes this difference is surprisingly great. For example, in dyeing a brown by using a mixture of colors as is usually done, if one stock were capable of absorbing less of the yellow dyestuff, the change in shade would be very perceptible even though the difference in the yellow element were only 2 per cent.—Alfred J. Carbone.

● TEXTILE STANDARDS

This compilation of A.S.T.M. Standards on Textile Materials gives all of the 37 standard specifications and tests which have been developed by Committee D-13 and in addition provides other data and information in compact form that is believed to be of importance to all who deal with textile materials.

In addition to A.S.T.M. standards there are given a proposed potassium dichromate oxidation method for the determination of total iron in asbestos textiles; proposed method of test for fastness of dyed or printed cotton fabrics to laundering or domestic washing; proposed method of test for slippage in silk and rayon woven broad goods; numerous photomicrographs of common textile fibers; yarn number conversion table; and a psychrometric table for relative humidity. Abstracts of papers presented at D-13 meetings during the past year are also included.

The new edition of this book provides new or recently revised standards for the following: woolen or worsted yarns, asbestos yarns and roving, chafer tire fabrics, Holland cloth, hose and belt ducks, light and medium cotton fabrics, pile floor covering, testing fineness of wool, shrinkage in laundering of silk and rayon woven broad goods, strength test of rayon woven fabric when wet, general test methods for cotton fiber. A number of these standards are printed for the first time in the compilation.

In addition to the above materials a large number of other textile products are covered, such as asbestos roving tape and yarns, duck (annealing, hose and belt, and numbered) tubular sleeving and braids, silk and cotton tape, electrical tape, sewing threads, knit goods, grease wool, etc.

Copies of this book, 246 pages, in heavy paper cover, can be obtained at $1.50 per copy from A.S.T.M. Headquarters, 260 S. Broad St., Philadelphia.

● GENERAL RELEASES

General Dyestuff Corp. announces release of the following circulars:

Fastusol Pink BBA—a direct color said to be of very good fastness to light and good fastness to washing, producing bluish pink shades on cotton and rayon. It is stated that the color will not stain acetate silk or pure silk and can be discharged to a clear white. Circular No. G-137.

Brilliant Benzo Fast Green GL—said to produce a very clear yellowish green of good fastness to light on cotton and rayon and to dye extremely level. Circular No. I. G. 1095.

Diamine Bordeaux BA—said to produce full shades of bordeaux on cotton, rayon, pure silk and weighted silk and to be easily dischargeable. Circular No. G-136.

● OFFICERS, U. S. I. T. R.

The Board of Directors of the U. S. Institute for Textile Research have announced the election of the following officers and executive committee: President, Hon. Francis P. Garvan; Vice-Presidents: Dr. E. H. Killheffer, Dr. H. DeW. Smith, Prof. L. A. Olney, Alban Eavenson; Prof. E. R. Schwarz; Treasurer, Ernest N. Hood; Secretary, Charles H. Clark; Executive Committee: Dr. E. H. Killheffer, Chm., Alban Eavenson, Ernest N. Hood, Joseph Bancroft, P. A. Johnson, Dr. Robert E. Rose, Dr. H. DeW. Smith, Dr. W. E. Emley, Prof. E. R. Schwarz.

Committees

Committee on Meeting: William W. Buffum, Chairman; Dr. H. DeW. Smith, Prof. E. R. Schwarz, C. H. Clark.

Nominating Committee: Dr. Robert E. Rose, Chairman, Joseph Bancroft, Alban Eavenson.

Conference Committee: Dr. H. DeW. Smith, Chairman, H. E. Bishop, B. L. Hathorne, C. H. Clark.

Reception Committee: Alban Eavenson, Chairman, Ernest N. Hood, P. A. Johnson, D. E. Douty, A. M. Tenney.

CLASSIFIED

SALESMAN WANTED—Position open for experienced salesman to cover the southern states selling well known and extensively advertised line of textile chemicals, oils and sizes. Require a man having mill experience, familiar with use and application of these products and capable of demonstrating. Write in detail. Box 87, American Dyestuff Reporter.